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# *Information Compensation Perspective: Digital Translation Design Practice of Song Dynasty Book Illustrations*

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***Abstract.*** Under the background of cultural digital strategy and media change, traditional Song Dynasty book illustrations face problems. They leave paper reading environment. People cannot understand their stories well. Their guiding function does not work well. This paper takes Song Dynasty book illustrations as research object. It wants to keep the original text meaning. It uses design to help images show narrative guiding function in digital environment. This study uses the view of "information compensation". It builds a practice process. The process includes: text narrative structure analysis, style limited visual creation, simple dynamic presentation. This paper studies the specific ways and limits of digital presentation of Song Dynasty book illustrations. It hopes to provide practical reference for digital translation of ancient book images and spread of cultural heritage. The reference respects traditional aesthetics and fits modern digital cognitive habits.

***Keywords:*** Song Dynasty book illustrations, ancient book digitalization, information compensation, narrative activation

## 1. Introduction

Under the guidance of the national cultural digital strategy in the 14th Five-Year Plan, the deep development and active use of ancient books have become an important part of cultural inheritance [1]. Song edition books are very important examples of traditional Chinese ancient books. They have excellent carving, strict layout and high academic collation value. So people say "one page is worth a thousand pieces of gold" [2]. The illustrations in them are visual forms of text information. In traditional reading, they play an important role in helping narration and guiding understanding. However, with the use of digital technology, Song edition books are changing from traditional paper preservation to digital communication. This change improves communication efficiency, but it also changes the way people look at them. In the digital interface, the original continuous page turning is gradually replaced by fragmented search and partial browsing. As a result, the guiding function of illustrations, which originally depended on the text context, is weakened in the digital environment. This break in narration is not only a technical limitation, but also a social psychological adaptation problem caused by media changes. Based on this, this paper focuses on the understanding difficulties of Song edition book illustrations in the digital context. It tries to improve the narrative understanding effect of illustrations through design methods. It hopes to provide a methodological reference that conforms to cognitive habits for the digital translation of traditional book images.

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## 2. Art value: from Song edition books to Song edition book illustrations

Song Dynasty was a key period when ancient Chinese cultural communication changed greatly. With the maturity of woodblock printing technology and the formation of the book market, books were no longer only manuscripts mastered by a few scholars, but became cultural carriers that could be printed and circulated in large quantities. The audience continued to expand, and the types of books also increased obviously. In addition to Confucian classics, history, philosophy and literary works, books involving medicine, skills, ethics and daily life began to appear in large numbers [3]. In this context, how to let more readers understand the content in the book became a practical problem that book makers and editors in Song Dynasty had to face.

It was to meet this change in reading needs that illustrations began to appear in large numbers in Song edition books. Illustrations were not randomly added decorations, but a response to the change in reading methods. For readers of different levels, it was often difficult to explain complex skills or truths only by words, so images were introduced into books as an important means to help understanding. Scholars such as Tian Jianping pointed out that the layout design, text-image relationship and printing technology of Song Dynasty books were gradually formed in actual use and communication needs. Illustrations thus became a stable part of the book structure, and basic norms were gradually formed in layout position and size [2].

From the perspective of cultural function, Song edition book illustrations played multiple roles in knowledge dissemination, behavior standardization and social recording. In books of medicine, agriculture and technology, images directly participated in the teaching of knowledge and undertook the role of visualizing experience and skills. When analyzing Song Dynasty medical illustrations, Huang Xia mentioned that acupuncture point maps helped readers turn words into vivid and operable steps through dot and line markings and layout indications, so that complex medical experience could be widely preserved and continued to this day without oral transmission [4]. Similarly, Song edition book illustrations also undertook the role of standardizing behavior and transmitting values. Song Dynasty society attached importance to ethical order, and a large number of biographies, moral and ethical books were widely spread through printing. Relevant research by Cui Shiwei found that many ethical printed books used pictures to demonstrate typical behaviors, and expressed moral judgments through people's postures, expressions and scene arrangements. This allowed readers with different education levels to quickly understand the code of conduct in the book, and it was easier to form a unified value cognition in society [5]. In addition, the clothing styles, utensil styles and life scenes presented in the illustrations also preserved a lot of social details, becoming important visual materials for later generations to understand Song Dynasty social life [6]. It can be said that Song edition book illustrations not only served reading itself, but also participated in the construction of knowledge structure and social order to a certain extent.

In terms of art, Song edition book illustrations formed a visual language closely related to woodblock printing conditions. Scholars such as Huang Xia analyzed and pointed out that restricted by engraving technology, Song edition book illustrations mainly used lines as the main modeling method, emphasized black and white contrast, and rarely relied on complex changes of light and shade. The thickness, density and rhythm of lines were used to distinguish people, utensils and spatial levels, so that the picture remained clear and readable in a limited space [4]. Such expression originated from technical conditions and gradually developed into a stable aesthetic orientation. In modeling, Song edition book illustrations emphasized generalization rather than detail reproduction, expressing situations and interactions through people's postures, orientations and positional relationships. Important characters were often placed in the visual center, and sight and actions formed narrative clues, so that readers could grasp the structural focus of the picture in a short time.

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At the same time, illustrations always kept close contact with words. Images were embedded between lines, and together with blank space and layout, they formed the page order. It was not a single image for independent viewing, but gradually played a role in the process of turning pages and reading, with a clear functional orientation [2].

It was this visual language gradually formed in social needs and technical conditions that made Song edition book illustrations maintain a relatively stable balance between function and form. It not only served explanation, demonstration and recording, but also accumulated a distinctive art style in long-term use, and had a continuous impact on later prints and book illustrations. Based on the above values of culture and art, it can be seen that Song edition book illustrations are not historical images that can be simply separated or viewed in isolation. Its meaning is based on a specific layout structure and reading order, and the text-image relationship and viewing method together constitute its functional foundation. Understanding this structure is the premise for the subsequent discussion of its modern expression.

## 3. Background and practical context of ancient book digitization

Song edition books and their illustrations have very high historical and artistic value. But most of them are paper rare books. They need very strict storage conditions. So their actual use and spread are greatly limited. Under this background, the digitization of ancient books has become an important way to connect protection and use. Organizing ancient books through digital methods not only relieves the pressure of physical preservation, but also makes it possible for traditional documents to continue in modern times. From the perspective of preservation, digitization allows document content to be stored for a long time in the form of high-precision images. It reduces physical damage caused by checking the original copies. It provides convenience for later collation and research work [7]. At the same time, digitization obviously expands the spread range of ancient books. Through network platforms and databases, documents that could only be read inside specific collection institutions can be accessed by more researchers and the public. Functions such as catalog browsing, keyword search and image enlargement lower the difficulty for users. Ancient books are gradually used in teaching, research and public cultural communication. This improvement in accessibility makes ancient books not only preserved, but also re-enter the process of modern cultural communication [7].

In existing practice, most digitization projects take book pages as the basic processing unit. Through scanning, image processing, OCR recognition and metadata annotation, they turn paper documents into searchable and browsable digital resources. This method usually organizes content by volume or catalog. With page-level search and jump functions, it meets users' needs for quick search and partial reading. It has become a common technical path [8]. Some large projects further explore the display ways of digital results on this basis. For example, the project "Two Centuries of Indian Printed Books" of the British Library uses special pages, timelines, maps and interactive resources to help users understand the historical context and connections of documents [9]. This kind of practice trend shows that digitization can not only turn paper into image resources, but also try to further reorganize and present knowledge content.

From existing research and practice, the value of digitization in preservation and communication has gradually appeared. However, the digital environment mainly based on page images and search browsing improves efficiency and also changes readers' reading habits. Traditional paper reading depends on the context connection from continuous page turning. Digital reading prefers jumping and fragmentary browsing. Under this condition, illustrations are often shown as single thumbnails. The close connection between illustrations and text is broken. Compared with the narrative logic

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developed with text in paper pages, illustrations in digital interface are easier to be viewed alone. Their original prompting and guiding functions are weakened. Therefore, the change of reading conditions changes the way people understand illustrations. This change is a media reality that needs to be faced squarely in the digital environment.

## 4. Presentation path of Song Dynasty book

After clarifying the historical value and digital current situation of Song edition book illustrations, we need to answer a key question: when illustrations leave the continuous reading environment because of media change, how can their original narrative function formed by the cooperation of text and images be perceived again in the digital environment. The idea of "information compensation" put forward by Hao Chuntao in the digital research of Yungang Grottoes provides method inspiration for understanding this problem. He regards the material form of cultural heritage as a medium with specific information transmission ability. He points out that although traditional media can solidify historical information in the time dimension, they often face understanding obstacles in modern communication because of the change of viewing conditions. For example, the meaning of grotto statues highly depends on physical movement, space sequence and light change when viewing on site. When these conditions are missing in digital images, viewers will easily misunderstand the connotation of statues. Therefore, he proposes that later media should undertake compensatory function, that is, without changing the original material form, targeted supplement the information conditions weakened by media conversion, so as to help viewers re-enter the original understanding mechanism [10].

We can apply this idea to the context of Song Dynasty book illustrations. We can find that the narrative meaning of illustrations also depends on specific reading conditions. The relationship between text and images formed by continuous page turning and the time sequence brought by reading rhythm form the basis of meaning generation. When digital interface replaces linear reading with search and partial browsing, illustrations are completely preserved, but the mechanism of understanding no longer happens naturally. The meaning of "information compensation" is to change the problem from image content to the reconstruction of understanding structure, making digital intervention the repair of reading mechanism, not the transformation of images.

Based on this understanding, this paper regards "information compensation" as a perspective of design intervention, aiming to prompt the narrative clues that are difficult to be quickly mobilized in paper environment. Its core principle is to respect the integrity of the original medium, and position the digital medium as auxiliary rather than alternative. For Song Dynasty book illustrations, this means that the intervention of digital technology must be based on two basic premises: first, the original images of illustrations cannot be modified or replaced, and their material authenticity as historical relics must be completely preserved; second, the text content attached to illustrations cannot be deleted or rewritten, and its authority as the source of meaning must be maintained. Under this constraint, the compensation function of digital media is mainly reflected in three aspects: first, rebuild the visual connection between illustrations and text through digital connection; second, clarify the implied behavioral relationship in illustrations through prompt mechanism; third, moderately expand the compressed plot in static images through sequential expression. Its goal is to help viewers re-establish the understanding bridge between images and text.

At the specific operation level, this presentation path includes three progressive links. First, the dismantling of text narrative structure. Because illustrations only show key nodes, a lot of plot promotion depends on words. So the starting point of compensation must return to the text. We can accurately locate the nodes of understanding break by dismantling narrative units. Second, the

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restriction of visual style. The generation of compensatory visual information must strictly follow the visual grammar of Song Dynasty illustrations, including line rhythm, modeling proportion and other core features. Ensure that the new information is visually consistent with the original work, so that it stays at the level of prompt rather than re creation. Third, the moderate use of dynamic presentation. As a guiding method, dynamization is used to show the implied relationship clues in static images. Each change must correspond to a clear plot function, avoiding introducing irrelevant dramatic effects.

Overall, "information compensation" provides a practical path for the digital translation of Song Dynasty book illustrations, which combines historical respect and modern adaptability. This path is based on text narrative analysis to ensure the necessity and accuracy of compensation intervention; takes historical visual grammar as the boundary to ensure the cultural credibility of generated content; takes moderate dynamic effect as a means to realize the gentle display of cognitive clues. The three together form a controlled design framework, which changes the technical intervention from the value debate of whether to do it to the methodology discussion of how to do it with boundaries.

## 5. Design transformation practice of Song edition book

This study takes the historical narrative illustrations in the Song edition Biographies of Exemplary Women as the practical object of "information compensation". Biographies of Exemplary Women takes people's stories as the basic narrative unit, and there is a highly dependent relationship between images and texts. This layout method with narrative nodes as the core makes it a typical case for the practice of "information compensation".

In the practice process, first, the text structure of Biographies of Exemplary Women was carefully sorted out and analyzed. As shown in Table 1, taking a single character story as a unit, this study marked the narrative nodes directly related to the illustrations through the study of the original text. For example, in the story of Guan Zhong and Ning Qi, the text describes in detail the key turning points such as Ning Qi hitting the ox horn and singing, Guan Zhong's worry, and concubine Jing explaining the meaning of the poem. These plots are often compressed into a single picture in the original illustrations, or only shown as people sitting together, making it difficult for modern audiences to directly understand the complex plot changes from the images. Through text dismantling, the research divides the original story into several narrative units with time sequence relationships, each unit corresponds to the potential visual prompt demand, which provides a clear logical direction for the subsequent visual compensation.

Table 1. Textual storyboarding based on narrative logic

| No. | Textual Narrative Unit (Based on the Original Text) | Narrative Node Function | Explicitly Developed in the Text | Presented in the Original Illustration | Text–Image Narrative Comparison (Design Rationale) |
|---|---|---|---|---|---|
| 1 | Ning Qi disguises himself as a servant and sings while striking an ox horn outside the eastern gate of Qi. | Unusual behavior / foreshadowing of ambition | Yes | No | The key motivation is conveyed entirely through the text; the illustration does not depict the temporal or behavioral starting point. |

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Table 1. (continued)

| | | | | | |
|---|---|---|---|---|---|
| 2 | Duke Huan of Qi notices the anomaly and orders Guan Zhong to summon Ning Qi. | Event trigger | Yes | No | The plot-driving decision is not visualized and must be understood through the text. |
| 3 | Ning Qi says, "Vast indeed is the White Water," but Guan Zhong cannot grasp its meaning. | Breakdown of understanding | Yes | No | The central conflict in the narrative is completely invisible in the illustration. |
| 4 | Guan Zhong remains troubled and uneasy after failing to understand. | Psychological state development | Yes | No | The emotional shift depends on textual narration; the illustration offers no psychological cues. |
| 5 | Jing, the concubine, points out that talent should not be judged by status, gender, or age. | Value argument (analogy) | Yes | No | The development occurs entirely at the level of language and ideas. |
| 6 | Jing cites examples such as Jiang Taigong and Yi Yin. | Deepening of the argument | Yes | No | Cultural and historical references cannot be directly visualized. |
| 7 | Jing explains that "White Water" refers to a poem titled White Water, revealing Ning Qi's aspiration. | Key interpretive turning point | Yes | No | The most critical "explanatory node" of the narrative is text-dependent. |
| 8 | Guan Zhong reports to Duke Huan of Qi and recommends Ning Qi. | Transformation into action | Yes | No | The chain of decisions and actions does not appear in the image. |
| 9 | Duke Huan of Qi fasts and ceremonially receives Ning Qi, appointing him as a high minister. | State-level outcome | Yes | No | The narrative resolution is completed solely through text. |
| 10 | The three figures appear together in a single scene, forming a symbolic juxtaposition. | Situational symbolism | No (implicit) | Yes | The illustration compresses the entire narrative into a symbolic scene of coexistence. |

In the visual generation stage, the practice uses the method of fixed visual style generation to supplement and present the key plots in the narrative units. To make sure the generated images have the same visual style as Song edition illustrations, the research uses machine learning to build a visual style constraint model. This model uses LoRA (Low-Rank Adaptation) structure. It uses many collected Song edition illustration samples as training data. It mainly learns the density of lines, the rhythm of black and white contrast, and the special proportion of human figures. After many rounds of human evaluation and continuous improvement, the images generated by the style constraint model are very close to the historical form of Song edition illustrations (Figure 1). This technology makes sure that the compensatory content does not break the visual feeling when people see it. It keeps the unity of the document display.

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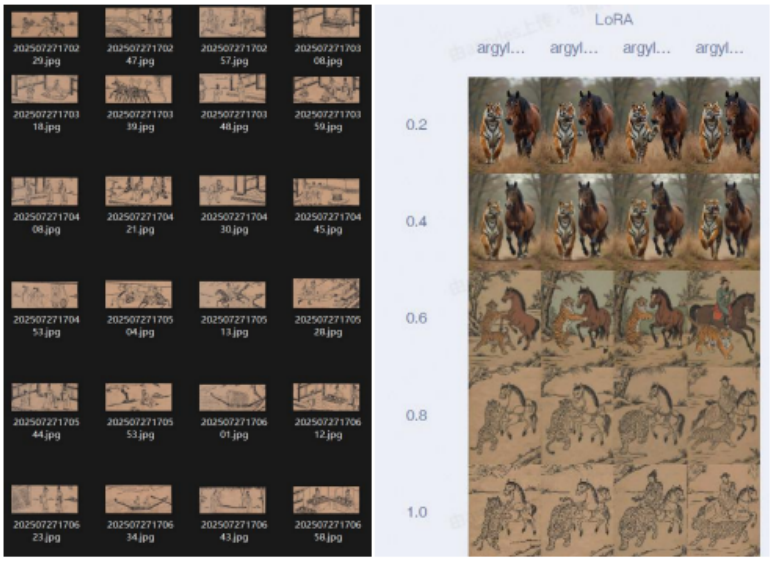


Figure 1. Illustration sample dataset and training of style constraint LoRA model

After the style model becomes stable, it enters the stage of static narrative material generation. This stage strictly follows the narrative nodes decided by the early storyboard analysis. Each generated image corresponds to a specific plot unit in the text. It produces static materials with time sequence relationship (Figure 2). In the generation process, the research sets strict boundary rules: keep the basic composition frame of the original illustrations, do not add unrelated people or background elements, and keep the same level of information complexity as the original illustrations. These rules make sure that the generated materials continue the simple tradition of Song edition illustrations. At the same time, by slightly changing the posture or sight of people, they leave necessary space for the dynamic processing of later materials.



Figure 2. Static materials with time sequence relationship

Finally, based on the completion of static visual compensation, the research further uses dynamic presentation to improve the readability and narrative guidance of the compensated information. The practice uses the open-source video generation model Wan 2.2 and builds the ComfyUI workflow (Figure 3) to do slight dynamic processing on the static materials. It includes slow change of people's sight direction, small natural change of posture, gradual appearance of picture elements and rhythm connection, etc. In the processing, it always avoids too dramatic dynamic effects. All dynamic ranges are controlled within the range of helping narration. In this way, the picture keeps the simple and concise style, and improves the visualization of narrative clues. It provides visual clues for viewers to enter the narrative structure.

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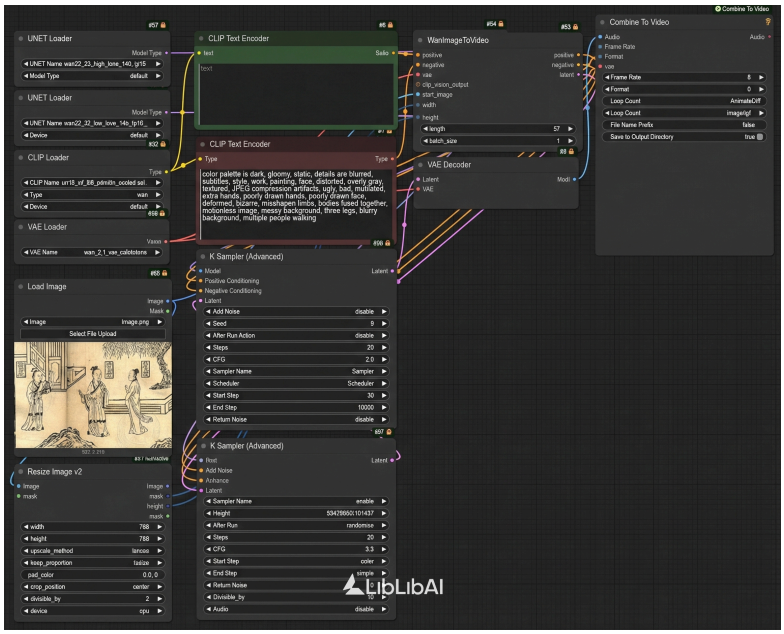


Figure 3. Construction of ComfyUI workflow

This practice shows that design transformation from the perspective of information compensation can effectively improve the reading trigger mechanism of Song edition book illustrations in the digital environment on the premise of respecting the historical original appearance. It proves that the path from text dismantling to style constraint generation and then to slight dynamic presentation is operable. It also provides specific boundaries and references for the digital translation of ancient book images.

## 6. Conclusion

This paper takes the narrative activation of Song edition book illustrations in the digital context as the core topic. From the perspective of "information compensation", it discusses the challenges faced by traditional book images in the process of media transformation. The study believes that the narrative break of ancient book illustrations in the digital environment is not due to the lack of image information itself, but because the original text-image cooperation mechanism and reading conditions have changed. In fragmented digital browsing, illustrations are separated from the real-time help of text, so their original guiding and explanatory functions are difficult to work. Therefore, the intervention of digital media should not be simple image redrawing, but should make up for the lost reading clues through design methods.

In specific practice, this paper proposes an operation path from text analysis to style-constrained generation, and then to mild dynamic presentation. It emphasizes that on the premise of respecting the historical visual style, appropriate visual prompts are given to narrative nodes to help the audience establish the connection between images and story plots in a short time and reduce the cognitive burden of the audience. Through the practical exploration of the illustrations in Biographies of Exemplary Women of the Song Dynasty, it is proved that this path can use digital technology to rebuild the reading trigger mechanism without changing the content of the original documents, so that static images can be understood again in the digital environment.

Overall, this study tries to find a balance between traditional visual order and contemporary cognitive habits, and proposes a design idea that respects tradition and adapts to digital media.

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Although this paper has achieved certain results in the dynamic transformation of narrative illustrations, this method framework still needs further testing and improvement when facing different types of ancient book content and more complex interactive forms. Future work will continue to explore how to apply this path more widely to promote the continuous spread of ancient book images in the digital context, so that traditional cultural information can enter the public vision in a clearer and easier-to-understand way.

## References

[1] Yang, X., & Yang, Q. (2025). The current status and development strategies of promoting ancient books on Douyin short-video platforms. Journal of Tianjin Normal University (Social Sciences Edition), 6, 137–146.
[2] Tian, J. (2011). Book design, illustrations, and aesthetic characteristics of the Song dynasty. Journal of Hebei University (Philosophy and Social Sciences), 36(4), 66–75.
[3] Li, P., & Liu, L. (2014). On the development of Song dynasty woodblock prints and their artistic design. Lantai World, 35, 191–192.
[4] Huang, X. (2010). A study on the value of woodblock illustrations in Song dynasty books (Master's thesis). Southwest University.
[5] Cui, S. (2020). Neo-Confucian thought in Song dynasty woodblock prints (Master's thesis). Hebei Normal University.
[6] Peng, T. (2007). Folk customs in Song dynasty woodblock prints (Master's thesis). Henan University.
[7] Li, M. (2025). Digital dissemination of ancient books: Content, effectiveness, and prospects. People's Tribune, 22, 106–109.
[8] Li, S., Zhang, X., Shen, W., et al. (2023). Analysis of domestic and international research on the digitization of ancient books and path construction. Modern Information, 43(11), 4–20.
[9] Li, R., Ding, F., Li, Z., et al. (2024). Construction and utilization of digitized rare-book resources in the British Library and its implications: A case study of the "Two Centuries of Indian Print" project. Library Science Research, 3, 35–42.
[10] Hao, C. (2013). "Symbiosis" and "transformation": Information compensation paths of media in the Yungang Grottoes. Literature and Art Studies, 5, 138–140.